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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/767,210	01/18/2001	Alexander Berestov	4529(CFP1506USA)	4461
758	7590	03/25/2004	EXAMINER	
FENWICK & WEST LLP SILICON VALLEY CENTER 801 CALIFORNIA STREET MOUNTAIN VIEW, CA 94041			BHATNAGAR, ANAND P	
			ART UNIT	PAPER NUMBER
			2623	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/767,210

Applicant(s)

BERESTOV, ALEXANDER

Examiner

Anand Bhatnagar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) 1-4, 8-13, 26-33, 36-42 and 46-48 is/are rejected.
- 7) ☒ Claim(s) 5-7, 14-25, 34, 35 and 43-45 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. A.) The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 48 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. This claim is not enabled because there are no positively recited steps in the claim. It is not clear where the preamble ends, where the body of the claim begins, and the transition from the preamble to the body of the claim. Examiner does not give any weight for "intended use". Examiner will address this claim as best understood.

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- B.) The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 4 recites the limitation "the intensity level determined for each pixel." There is insufficient antecedent basis for this limitation in the claim. This claim is dependent from claim 2 but claim 2 does not have any single pixels, this claim is

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dealing with groups of pixels and not single pixels. Examiner will address this claim as best understood.

Claim 48 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This claim is indefinite because there are no positively recited steps in the claim. It is not clear where the preamble ends, where the body of the claim begins, and the transition from the preamble to the body of the claim. Examiner does not give any weight for "intended use". Examiner will address this claim as best understood.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 9-13, 26-33, 36-42, and 46-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. ("Robust 3-D Depth Estimation Using Genetic Algorithm in Stereo Image Pairs", Proceedings of IEEE Asia Pacific Conference on Circuits and Systems; pages 357-360, Nov. 18-21, 1996; Seoul, Korea) and Wei et al. ("Intensity- and Gradient –Based Stereo Matching Using Hierarchical Gaussian Basis Functions", IEEE Transactions on Pattern

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Analysis and Machine Intelligence, pages 1143-1160, Vol. 20, No. 11, November 1998).

Regarding claims 1, 8, 13, 26, 27, 33, 36-40, and 46-48: Kim et al. discloses a method for stereo image processing of an object (Kim et al.; Abstract) the method comprising the steps of:

obtaining at least a pair of stereo images each having a plurality of pixels, said stereo images being a digital representation of a corresponding pair of stereo radiographs taken of the object (Kim et al.; page 357 under the abstract and Introduction, where there are two 2-dimensional images being used to obtain a 3-Dimensional image);

Kim discloses to perform a process to generate a 3-D image from two 2-dimensional images. Kim does not disclose to have these two two-dimensional images to be radiographic images. It would have been obvious to one skilled in the art to use apply this system to many different technological fields (such as in medicine, computer graphics, architecture, etc.) where it is necessary to obtain a 3D image of an object from two dimensional images.

correcting illumination errors within the pair of stereo images (Kim et al.; page 358 under section 2. Stereo correspondence, where the intensity/illumination/brightness between the images are matched).

Kim discloses to perform a process to generate a 3-D image from two 2-dimensional images. Kim further discloses to match the intensity/illumination/brightness values between the images to create a 3D

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image. Kim et al. does not teach to correct the intensity/illumination errors to create the 3D image. Wei et al. discloses to correct the intensity difference between the images (Wei et al.; page 1147 right column last paragraph). It would have been obvious to one skilled in the art to combine the teaching of Wei et al. to that of Kim et al. because they are analogous in stereo image processing. One in the art would have been motivated to incorporate the teaching of Wei et al. to that of Kim et al. in order to compensate for the camera response.

removing distortions from the pair of stereo images (Kim et al.; page 358 under section 2, wherein the noise/distortion must be removed if using intensity based matching)

combining pixels of the pair of stereo images into a composite image (Kim et al.; abstract and introduction); and

adjusting a corresponding screen parallax for the composite image (Kim et al.; page 357, wherein the depth is considered in the stereo matching. The depth is read as the screen parallax).

Regarding claims 2, 9-12, 28, 31, and 42: The method wherein the step of correcting illumination errors comprises the sub-steps of:

selecting a first group of pixels from a first image of the pair of stereo images (Wei et al.; page 1144 left column last paragraph, wherein the pixels of the two images is matched for their respective locations in each of the images. This is read as selecting a first and second group of pixels in their respective images);

selecting a second group of pixels from a second image of the pair of stereo images, the second group of pixels being respectively associated with the first group of pixels (Wei et al.; page 1144 left column last paragraph, wherein the pixels of the two images is matched for their respective locations in each of the images. This is read as selecting a first and second group of pixels in their respective images);

determining an intensity level for each pixel in both groups of pixels (Wei et al.; page 1144 left column last paragraph, wherein the intensity of these pixels is determined);

Kim et al., as modified by Wei et al., teaches to compare and correct intensity levels of groups of pixels between two images to generate a 3D image. Kim et al., as modified by Wei et al., does teach to determine the mean intensity level and the variance of these group of pixels in their respective pixels and to equalize these respective values and/or adjust the pixels to equalize these values. It would have been obvious to one skilled in the art to modify the system of Kim et al., as modified by Wei et al., to include using other factors related to image correction, such as mean intensity values, variance, standard deviations, gray scale values, etc. and to equalize these values between the images and/or adjust the pixels of the images so that the values will match between the images.

Regarding claims 3 and 29: It is rejected for the same reason as claim 2 above it is a well known technique in the art to compare pixel values between

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images and correct for any disparity which is disclosed in the introduction of Wei et al. (Wei et al.; page 1143 right column bottom paragraph)

Regarding claims 4 and 32: The method wherein the intensity level determined for each pixel comprises gray-scale values. Examiner takes Official Notice because using gray-scale is well known in the art.

Regarding claim 26: The method of Claim 1, wherein the step of adjusting a corresponding screen parallax comprises the substeps of:

displaying the composite image on a display device, the display device including a viewing surface; and

locating the object in the composite image near the viewing surface in order to minimize depth range.

Regarding claim 30: The computer-implemented method wherein the second group of pixels is selected according to a matching algorithm (Kim et al.; page 357 under section II Stereo Matching, where an matching algorithm is used).

Regarding claims 27-33, 36 for the computer implemented method and claim 41 for the storage device, computer readable medium and display: Examiner takes Official Notice.

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Allowable Subject Matter

2. Claims 5-7, 14-25, 34, 35, and 43-45 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Webb et al. (U.S. patent 5,818,959) for producing a 3D image from 2D images.

Contact Information

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anand Bhatnagar whose telephone number is (703) 306-5914, whose supervisor is Amelia Au whose number is 703-308-6604, group fax is 703-872-9306, and Tech center 2600 customer service office number is 703-306-0377.

AB

Anand Bhatnagar

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March 21, 2004



**SAMIR AHMED
PRIMARY EXAMINER**